

IN THE CLAIMS:

Claims 10 and 12-20 are pending in the application.

Please amend claims 10 and 13 as shown below. Please also add new claims 42-45.

1. (Withdrawn) An apparatus for processing a substrate, comprising:
a plurality of vacuum chambers, the vacuum chambers defining a peripheral envelope of space;
a plurality of pumps, each of the pumps having an inlet connected to at least one of the vacuum chambers and an outlet exhausting gas to atmospheric pressure and;
a system controller, for controlling gas pressure in at least one of the chambers, and the rate of evacuation of gas from the chambers.
2. (Withdrawn) The apparatus of claim 1, wherein the plurality of pumps is disposed within the envelope of space defined by the chambers.
3. (Withdrawn) The apparatus of claim 1, wherein the system controller is programmable to control the gas pressure by changing the speed of one of the pumps in relation to a signal from a chamber pressure gauge according to a programmed set of instructions for processing the substrate.
4. (Withdrawn) The apparatus of claim 1, wherein the system controller is programmable to control the rate of evacuation of gas by changing the speed of one of the pumps in relation to a signal from a chamber pressure gauge according to a programmed set of instructions for reducing condensation of moisture in the chamber.
5. (Withdrawn) The apparatus of claim 1, wherein the system controller is programmable to control the efficiency of at least one of the pumps by changing the speed of the pump.

6. (Withdrawn) The apparatus of claim 5, wherein the system controller is programmable to control the efficiency of at least one of the pumps by changing the speed of the pump between a low speed, a high speed and an idle speed.

7. (Withdrawn) The apparatus of claim 6, wherein the low speed is about 30 Hz, the high speed is about 100 Hz and the idle speed is about 30 Hz.

8. (Withdrawn) The apparatus of claim 6, wherein the low speed requires energy of about 500 to 750 watts, the high speed requires energy of about 3000 watts and the idle speed requires energy of about 500 watts.

9. (Cancelled)

10. (Currently Amended) An apparatus for processing a substrate, comprising:
a plurality of vacuum chambers defining an envelope of space in a clean room;
and

at least two pumps, each pump having an inlet connected to at least one of the chambers for evacuating gas in the chamber and an outlet that exhausts the evacuated gas to a pressure approximately equal to atmospheric pressure, the pumps being located within the envelope of space defined by the chambers in the immediate environment of the chambers;

and wherein ~~each of~~ the plurality of vacuum chambers ~~includes~~ comprises:

at least one load-lock chamber; and

at least ~~[[two]]~~ one transfer chamber~~[[s]]~~, with ~~[[each]]~~ the at least one transfer chamber having a plurality of process chambers disposed in a radial fashion there around, and with one of the pumps being disposed beneath the transfer chamber.

11. (Cancelled)

12. (Previously Presented) The apparatus of claim 10, wherein at least one of the process chambers and the load-lock chamber are elevated off of the clean room floor.

13. (Currently Amended) The apparatus of claim 12, wherein ~~each~~ one of the pumps is disposed beneath ~~one~~ each of the elevated process chambers, and ~~a fourth pump~~ one of the pumps is disposed beneath one of the elevated load-lock chambers.

14. (Previously Presented) The apparatus of claim 12, wherein one pump is disposed beneath a load-lock chamber, and two pumps are disposed each beneath one of the process chambers.

15. (Original) The apparatus of claim 12, further comprising at least four process chambers and two load-lock chambers connected to the transfer chamber and at least one pump disposed beneath each of the process chambers and at least one pump disposed beneath one of the load-lock chambers.

16. (Original) The apparatus of claim 15, further comprising two pumps stacked vertically and disposed at least partially beneath one of the load-lock chambers.

17. (Previously Presented) The apparatus of claim 10, wherein each transfer chamber has at least four process chambers and two load-lock chambers disposed therearound; and
wherein the apparatus further comprises six pumps disposed at a first end of the envelope beneath a gas supply panel, the pumps substantially within the footprint of the apparatus.

18. (Previously Presented) The apparatus of claim 10, wherein the pumps are each housed in an enclosure, the enclosure including noise and vibration reducing members.

19. (Previously Presented) The apparatus of claim 10, wherein the pumps include movable members to facilitate moving the pumps around a surface of a clean room floor.

20. (Original) The apparatus of claim 12, wherein two of the pumps are stacked vertically and are at least partially disposed under one of the chambers.

21. (Withdrawn) The apparatus of claim 10, wherein each of the pumps includes an exhaust line and wherein the exhaust lines are bundled together to form a single exhaust bundle.

22. (Withdrawn) The apparatus of claim 21, wherein the exhaust bundle is wrapped in a heater.

23. (Withdrawn) The apparatus of claim 22 wherein the heater includes a conductor carrying electrical current to heat gas within the exhaust lines.

24. (Withdrawn) The apparatus of claim 10 wherein each of the pumps includes an exhaust line and two or more of the exhaust lines are integrated into one common exhaust line for removing exhaust from two or more pumps.

Claims 25 – 27. (Cancelled)

28. (Withdrawn) The pump of claim 27, wherein the pump is surrounded by an enclosure, the enclosure having a substantially planar top surface, bottom surface, two side surfaces and two end surfaces, and constructed and arranged to reduce noise and vibration emanating from the pump and surface temperature.

29. (Cancelled)

30. (Withdrawn) The pump of claim 28, wherein the height, length and width ratio of the enclosure is about 1:2:1.

31. (Withdrawn) The pump of claim 28, wherein the height, length and width ratio of the enclosure is about 2:1:1.

32. (Withdrawn) The pump of claim 28, wherein the noise level of the pump when measured at a base pressure and a distance of 1 meter is equal to or less than 58 dB.
33. (Withdrawn) The pump of claim 28, wherein the pump enclosure has a plurality of machine interfaces, all of which are located on a single surface of the pump enclosure.
34. (Withdrawn) The pump of claim 28, wherein the bottom surface of a first pump enclosure is fixable to a top surface of a second pump enclosure, the pump enclosures thereby stackable.
35. (Withdrawn) The pump of claim 34, wherein the top surface of the second pump enclosure has a plurality of landing indentations, the landing indentations constructed and arranged to receive a plurality of similarly spaced landing protrusions extending from the bottom surface of another pump enclosure.
36. (Withdrawn) The pump of claim 34, wherein the bottom surface of the first pump enclosure includes at least one tab extending downward therefrom, the tab including an aperture there through and wherein the top surface of the second enclosure includes at least one tab projecting upward therefrom, the tab including an aperture there through, whereby when a first pump is stacked upon a second pump, the apertures align to receive a fastener thereby fixing the first and second pumps to each other.
37. (Withdrawn) The pump of claim 28, wherein a first end of the bottom surface of the pump enclosure includes two wheels partially recessed therein, and a second end of the bottom surface of the pump enclosure includes at least one pivoting wheel and a handle assembly facilitating the movement of the pump along a clean room floor by personnel.

38. (Withdrawn) The apparatus of claim 28, wherein the pump is mountable on a layer of vibration absorbing material, the plate located between and affixed to the bottom surface of the pump enclosure and the clean room floor.
39. (Cancelled)
40. (Withdrawn) The pump of claim 28, wherein the pump enclosure includes a ventilation system capable of drawing air through the enclosure from a first end of the enclosure to a second end of the enclosure where the air is exhausted to a ventilation exhaust line.
41. (Withdrawn) The pump of claim 40, wherein the ventilation system further includes a shroud constructed around an exhaust connection of the pump, the shroud in communication with the ventilation exhaust line whereby air around the exhaust connection is captured and exhausted through the ventilation exhaust line.
42. (New) The apparatus of claim 10, wherein the inlet of at least one of the pumps is connected to a corresponding chamber by means of a foreline, the foreline having a length of about 0.5 meters to 2.0 meters.
43. (New) The apparatus of claim 10, wherein the inlet of at least one of the pumps is connected directly to a corresponding chamber.
44. (New) An apparatus for processing a substrate, comprising:
a plurality of vacuum chambers defining an envelope of space in a clean room, the vacuum chambers being elevated off of the clean room floor, and the vacuum chambers comprising:
a load-lock chamber,
a transfer chamber, and
a plurality of process chambers disposed in radial fashion around the transfer chamber; and

a plurality of pumps, each pump having an inlet connected to at least one of the chambers for evacuating gas in the chamber and an outlet that exhausts the evacuated gas to a pressure approximately equal to atmospheric pressure, the pumps being located within the envelope of space defined by the chambers in the immediate environment of the chambers;

and wherein:

one of the pumps is disposed beneath the transfer chamber,
one of the pumps is disposed beneath the load-lock chamber, and
one of the pumps is disposed beneath each of the process chambers,
respectively.

45. (New) The apparatus of claim 44, wherein:

the transfer chamber has at least four process chambers and two load-lock chambers disposed therearound; and

the pumps are substantially within the footprint of the apparatus.